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Why is Unemployment Low in the Former Soviet Union?

Enterprise Restructuring and the Structure of Compensation

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Why have employment levels remained higher in the former Soviet Union (FSU) than in Central and Eastern Europe despite comparable shocks to output? Why are workers in the FSU more likely to remain (underemployed and underpaid) in state and privatized firms? And why do firms allow those workers to stay, despite reduced demand for their products?

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Summary findings

Commander and Tolstopiatenko explain why in the former Soviet Union (FSU) — especially Russia — unemployment has remained low and employment in state and privatized firms has remained high, while at the same time the informal or unofficial economy has grown swiftly.

They trace this development to a combination of factors, including the control regime of state and privatized firms, the nature of worker compensation, and the nature of subsidies or financial supports that firms continue to receive.

Firms have remained the primary site for social protection. Subsidies for social benefits have effectively been a subsidy to employment and have promoted the workers' continuing attachment to these firms. Partly because the subsidies still flow and partly because of the firms' internal control structure, firms have held back on shedding labor.

Firms typically work at low capacity. Instead of laying workers off, they significantly cut hours and wages, sometimes through wage arrears. The share of worker compensation that is nonmonetary has grown during the transition, and is significant. So workers search for additional sources of income. They keep their jobs, but in addition moonlight or get involved in the informal economy.

Why has this happened? Privatization has so far failed to keep firms from behaving as if they have important social responsibilities. Managers may have more discretion in decisionmaking, but seem to be reluctant to fire workers.

This reluctance reflects various pressures, including insider coalitions and pressure from local and federal governments to limit the flow to unemployment. One factor may be the need to keep workers cooperative and possibly to repel outsider interest. And in the FSU, many firms continue to operate under soft budget constraints, so they are under less pressure to reduce employment levels than firms in Eastern and Central Europe.

Commander and Tolstopiatenko show that under certain conditions if the subsidy to insider-dominated firms disappears, those firms will scale down employment and the provision of benefits. In a firm with two divisions — one that produces and one that provides benefits — the dominant (producing) division will tend to close down the benefits-providing division if the firm assumes a simple majority-decision rule.

This paper — a product of the New Products and Outreach Division, Economic Development Institute — is part of a larger effort in the institute to understand the nature of restructuring and unemployment in the transition economies. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Latifah Alsegaf, room M7-036, telephone 202-473-6442, fax 202-676-0965, Internet address lalsegaf@worldbank.org. June 1996. (20 pages)

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Introduction

One regularity in the transition has been a continuing divergence in the amount of unemployment that has been generated in East and Central Europe relative to the states of the former Soviet Union. Table 1 shows that using registrations data by 1995 unemployment in the former region exceeded 10 percent of the labour force. By contrast, unemployment in the FSU was below 2 percent. This discrepancy is sometimes attributed to measurement problems, as also the latter's relatively late start in the transition. Neither provides a wholly convincing explanation. Indeed, where labour force survey data are available, as is the case for Russia, unemployment rates still remain low relative to East and Central Europe, as can be seen in Table 1. Mis-measurement of unemployment cannot account for the gap. And while it is true that many of the states of the FSU have moved slowly on structural reforms, including privatisation, even where this has not been true -- and Russia is the obvious case in point -- unemployment still remains markedly lower than in East and Central Europe. Lags also cannot seemingly account for the large gap.

Another line of argument that has recently gained more currency has been to question official estimates of the drop in output and hence to lower predicted unemployment. According to this view, other indicators, such as energy consumption, suggest that output has actually declined far less than reported. For Kazakhstan, Russia and Ukraine, for example, the cumulative drop in electricity consumption between 1989 and 1994 was under half the reported decline in GDP [1]. This discrepancy is largely absent in East and Central Europe. Further, a growing share of output is accounted for by unofficial activity, commonly coexisting with activity in state or privatised firms, but almost all of which occurs outside the trawl of the tax net. Kaufmann and Kaliberda (1995), for example, come up with some rough estimates indicating that by 1994 the unofficial economy may have accounted for over 35 percent of aggregate output in the FSU and over 40 percent in both Russia and Ukraine. By contrast, the comparable share for East and Central Europe was not much above 20 percent and has actually declined in

[1] EBRD, Transition report, 1995, p182

Poland. The general conclusion is that the output drop has been far less sharp, particularly in the FSU, and this is a factor accounting for why unemployment has remained low.

Table 1: Unemployment rates in East and Central Europe and the Former Soviet Union, 1992-95

Country	1992	1993	1994	mid-1995
East & Central Europe				
Bulgaria	13.2	16.3 (21.4)	14.1(20.2)	13.0
Czech Republic	3.1	3.0 (4.1)	3.3 (4.0)	2.9
Hungary	10.7 (9.9)	12.8 (11.9)	11.3 (10.7)	10.5 (9.9)
Poland	12.9	14.9 (14.0)	16.4 (14.4)	15.0
Romania	6.2	9.2	11.0	10.3
Slovak Republic	11.3	12.9 (12.5)	14.6 (13.7)	13.8
FSU				
Armenia	0.2	5.2	6.4	5.5
Azerbaijan	0.2	0.5	0.8	0.9
Belarus	0.2	1.1	1.9	2.3
Kazakhstan	0.3	0.5	0.8	1.3
Kyrgyz Republic	0.1	0.2	0.4	1.3
Russia	0.4 (4.8)	1.0 (5.6)	1.7 (7.1)	2.7 (7.7)
Ukraine	0.3	0.4	0.4	0.4
Uzbekhistan	0.1	0.2	0.2	0.5

Note: The numbers are from registrations data. Figures in brackets are LFS numbers

Source: OECD and World Bank

However, while this highlights the importance of compensating output growth from sources other than the originally dominant state or privatised firms, it does not undermine the argument that output in the state or privatised sector has declined very significantly. As such, we still have to explain the discrepancies highlighted by Table 2. This shows that compared with East and Central Europe, changes in industrial employment relative to output since 1990 have run in opposite directions. In the former, employment has commonly adjusted faster than output. By contrast in the FSU there has

been a very substantial increase in employment given output. Firms facing large negative product market shocks and disruptions have tended to go slow on their adjustments to employment, with obvious consequences, as noted, for unemployment [2]. What the table omits, however, is that firms in the FSU have commonly reduced working hours and hence effective wages to those employed. Much of the offset to this income decline has been provided by unofficial activity. Workers have thus combined continuing attachment to state firms with growing involvement in informal activity. Rather than generating open unemployment, available evidence points to significant under-employment in state and privatised firms alongside widespread participation in informal private activity by workers.

Table 2: Change in employment relative to output in transition economies: 1990-1994

East and Central Europe		**FSU**	
Bulgaria	- 5.5	Armenia	+47.8
Czech Republic	+16.1	Azerbaijan	+37.5
Hungary	-12.8	Belarus	+23.9
Poland	- 24.5	Kazakhstan	+51.9
Romania	+20.1	Kyrgyz Rep	+88.4
Slovak Republic	+11.4	Russia	+62.7
		Ukraine	+36.6
		Uzbekhistan	- 6.1

Source: OECD, Short Term Economic Indicators, Paris, 1995

This paper is an attempt to explain why FSU -- and, most particularly, Russian -- employment in state and privatised firms has not only stayed high and unemployment low, but has also been accompanied by a very swift growth in the informal or unofficial economy. We trace this development through to a combination of factors that include the control regime of state and privatised firms, the composition of worker compensation and the nature of subsidies or financial supports that firms continue to receive. Through a combination of the inheritance and the structure of financial transfers, firms have remained the primary sites of social protection. We show that subsidies for social benefits have, in effect, been a subsidy to employment and have promoted continuing

[2] Commander, Dhar and Yemtsov (1995)

attachment of workers to these firms. Partly because of the continuing flow of subsidies, partly because of the internal control structure of firms, labour shedding has been held back. With firms commonly working at low capacity, workers have often taken significant cuts in hours and in monetary compensation, including through wage arrears. Such adjustments have not excluded continuing access to social benefits or the non-monetary component of compensation. But they have motivated workers to search for further sources of monetary income. The result has been continuing attachment alongside significant moonlighting or involvement in the informal economy.

Later we formalise this argument in a two sector model and look at the implications for labour allocation. Having done this, we then proceed to analyse the outcomes associated with a change in ownership, or, more exactly, an explicit insider privatisation, of the type that has dominated in Russia [3]. We show that insider dominated firms will tend to respond to a loss of subsidy for benefits by reducing employment and benefits and, under certain assumptions, will also tend to separate those divisions within the firm that have historically provided benefits.

Control, benevolence and soft budgets

Having indicated these particular features of the transition in the FSU, the obvious question to ask is why have they arisen and can they be expected to persist ? To answer this, we must necessarily start with the reasons for state and privatised firms continuing to keep employment high. One common view has been to emphasize the control structure of the characteristic FSU firm and, in particular, the evidence that, despite formal changes in control regimes, firms and their controlling agents continue to place a high weight on objectives that are a good deal broader than profit maximization. Firms behave as if they have important social responsibilities which cause them to act with benevolence. Privatisation has as yet failed to snap this behaviour. As such, we can think of these economies characterised by combinations of state-owned and privatised firms with both being dominated by insiders. In the former case, this indicates the effective loss of control by the state and in the latter, the nature of the privatisation process that has occured [4]. As

[3] Estrin, Earle and Leshchenko (1995) and Boycko et al (1995)
[4] See, for example, Boycko et al (1995)

regards the nature of this insider control, while there is evidence that managers may have acquired considerable discretion in decision-making, in terms of employment setting this discretion is severely qualified by the observed reluctance to impose involuntary separations on workers. While this reluctance may clearly reflect a variety of pressures, the need to maintain worker cooperation, possibly to repel outsider interest, may have been a factor behind this outcome.

Another key difference from East and Central Europe -- and one that may ultimately explain a significant part of this apparent benevolence -- has been the continuing flow of subsidies to firms. Table 3 indicates that in Russia, Ukraine and Kazakhstan transfers to the firm sector have stayed high, albeit on a declining trend. Moreover, these figures are likely to be severe under-estimates as they do not capture many of the transfers from local government to firms -- an increasingly important phenomenon -- not to speak of the widespread non-compliance in tax obligations by state and privatised firms and implicit subsidization through arrears. Evidence unequivocally shows that a significant share of the firm sector continues to operate under soft budget constraints, with that softness originating not only from the various levels of government, public utilities and the tax administration, but also from the financial system [5]. As such, the pressure to release labour coming from the budget constraint has been weaker than in East and Central Europe.

While the budget constraint is an important part of the story as to why unemployment in the FSU remains low, it is only a part of the story. And it is incomplete without thinking more specifically about the reasons for why workers choose to stay in state and privatised firms, as also why firms allow those workers to stay in, despite major and not easily reversible shocks to demand for their products.

[5] See Alfandari et al (1995)

Table 3: Subsidies to enterprises, 1992 - 1995 (% of GDP)				
Country	**1992**	**1993**	**1994**	**1995**
Kazakhstan	2.5	6.8	5.5	4.3e
Russia	31.6	8.6	4.9	
Ukraine	12.8	16.4	17.0	6.0e
Source: World Bank				

Benefits and compensation

One important inheritance of the Soviet system was that firms commonly provided a wide range of social benefits, including housing, child and health care, to their workers. This was particularly true in the larger firms, as measured by employment, and ensured that access to benefits was explicitly linked to the site of employment [6]. Indeed, the planners had aimed to raise attachment and lower turnover precisely by the use of such firm-specific components of compensation. Associated to this was a relatively low monetary wage. Survey evidence suggests that in 1992/93 benefits comprised roughly 30 percent of total labour costs in Russia [7]. At the same time, enterprise spending on social assets was reported in the range of 4 percent of GDP.

In both scope and scale of benefits provision, it is clear that since the start of transition changes have been relatively limited. Firms in both Ukraine and Russia have continued to offer roughly the same menu of benefits to their workers even when this has imposed a financial burden on the firm [8]. But it is also evident that many firms -- particularly the larger firms -- have received compensating finance for benefits provision from various levels of government. Le Houerou (1995) points out that regional and local governments tend to subsidise or extend ad hoc tax exemptions to firms that maintain large stocks of social assets. As housing divestiture to municipalities has been mandated in Russia, it is revealing that explicit housing subsidies in 1995 were around 4 percent of GDP. In other states of the FSU, housing still remains largely on the books of firms and

[6] An empirical overview is provided in Commander, Lee and Tolstopiatenko (1995)
[7] Commander, Liberman and Yemtsov (1993)
[8] Commander and Schankerman (1995)

with fixed utility prices and low cost recovery could be expected to impose a major burden on firms and/or government, depending on the degree of subsidy.

In sum, firms throughout the FSU provided many functions that would commonly be the responsibility of local governments in OECD settings. Workers had access to such benefits -- including merit goods, like health and child care -- through the firm. There was little cost recovery but workers received a low level of monetary compensation. The costs of benefits provision to the firm were commonly offset by subsidy from government. This financing regime has continued into the transition.

Compensation and labour allocation

We now try and think through in a more formal way the implications for labour allocation in an economy where the state and/or privatised sector provides its workers with benefits and hence with a mixed compensation package. We characterise the economy in terms of two sectors. One comprises benefits-providing firms and the other, which may or may not provide benefits, consists of de novo private firms. Workers in the state or privatised sector can allocate their effort exclusively to that sector or allocate their effort across both sectors. For workers in the state sector to retain attachment and ensure access to social benefits they must however give a minimum effort level.

The state sector

The state sector is dominated by insiders. Such firms are not constrained by their labour demand curves but set wages and employment consistent with their average product curves. This gives the sector some of the characteristics of the worker managed firm. Because multiple job holding is feasible, insiders' utility can most generally be written as;

$$U(N,w) = N^{ss}(u(w^s + b^s + p^s) - v(e^s)) + N^{sp}(u(w^s + b^p + w^p) - v(e_0^s + e_0^p)) + \\ +(M^s - N^{ss} - N^{sp})u(x)$$

Where $N^s = N^{ss} + N^{sp}$ is employment in the state sector. N^{ss} workers only have a job in the state sector, working with effort, e^s, and getting compensated, $w^s + b^s + p^s$ where, w^s =the cash wage; b^s = the value of social benefits per worker provided by the state firm and, $p^s = \lambda^s(e^s - e^s_0)$ or premium over the minimum effort required to stay attached. N^{sp} workers

have a primary job in state sector giving effort, e^s_0, and getting compensated, w^s+b^s. They also have a secondary job in the de novo private sector, giving effort e^p_0 and getting paid w^p. $M^s = N^{ss}+N^{sp}+U^s$ gives the number of those who seek work in the state sector.

With Cobb-Douglas technology in the state sector,

$Y^s = F(\bar{N}^s) = (\bar{N}^s)^\beta$, where $0 < \beta < 1$ and

weighted employment is; $\bar{N}^s = e^s N^{ss} + e^s_0 N^{sp}$

The constraint is given by zero profits;

$\pi^s = pF(\bar{N}^s) - w^{ss} N^{ss} - w^{sp} N^{sp} = 0$, where

$w^{ss} = (w^s + p^s) + b^s$; and $w^{sp} = w^s + b^s \le w^{ss}$ where e^s_0 is the minimum effort for retaining access to benefits and $p^s = \lambda^s(e^s - e^s_0)$ is thus the additional wage for those who work only in the state sector.

We can now solve the insider's problem, considering N^{ss} and N^{sp} as the only endogenous variables. With some manipulation and denoting χ as the marginal rate of substitution between workers with one and two jobs or as a ratio of net utilities (benefits) of one and two jobs;

$$\chi = \frac{u(w^s + b^s + w^p) - v(e^s_0 + e^p_0) - u(x)}{u(w^s + b^s + p^s) - v(e^s) - u(x)} \ge 1$$

$$\psi = \frac{e^s_0}{e^s} \le 1$$

$$\gamma = \frac{w^{sp}}{w^{ss}} \le 1$$

we find the ratio of workers with one and two jobs,

$$\theta = \frac{N^{sp}}{N^{ss}} = \frac{1}{\gamma} \cdot \frac{\chi - \gamma - \beta(\chi - \psi)}{\beta(\chi - \psi) - \gamma^{-1}\psi(\chi - \gamma)}$$

We can readily see that the increase in utility associated with a higher wage must at least compensate the disutility associated with the greater effort required when working in both sectors simultaneously. In other words, if the return to effort in the state sector is small -- $\lambda^s < pF'$ and $p^s < w^p$ -- then all who can find a secondary job in the private sector will take it and we will have a corner solution.

We have an interior solution if the following conditions hold;

i) $\chi > \gamma > \psi$

ii) $0 < \gamma^{-1}\psi \frac{\chi - \gamma}{\chi - \psi} < \beta \leq \frac{\chi - \gamma}{\chi - \psi} < 1$

Condition (i) means that the ratio of the net benefit of one and two jobs must be more than the ratio of the costs, which must be more than the ratio of their efforts. The last inequality simply means that remuneration for additional effort $p^s = \lambda^s(e^s - e_0^s)$ in the state sector must satisfy the condition (if taxes and subsidies are absent):

$$\frac{c^s}{c^s + p^s} = \gamma > \psi = \frac{e_0^s}{e^s}, \Rightarrow p^s = \lambda^s(e^s - e_0^s) < \frac{c^s}{e_0^s}(e^s - e_0^s), \Rightarrow \lambda^s < \frac{c^s}{e_0^s}$$

Condition (ii) simply restricts the range of values for the elasticity of output to employment from the production function for the existence of an interior solution.

Having found θ, we can determine the supply of moonlight workers;

$$N^{sp} = \begin{cases} \frac{\theta}{1+\theta} N^s & \text{with an interior solution} \\ N^s & \text{with a corner solution} \end{cases}$$

where employment in the state sector N^s satisfies the condition

$$pF(\bar{e}^s N^s) = N^s w^{ss} \frac{1+\gamma\theta}{1+\theta}$$

and where we introduced the effort function;

$$\bar{e}^s = \frac{e^s + \theta e_0^s}{1+\theta}$$

Having determined the supply of moonlight labour, we now turn to the demand side and look at the de novo private sector.

The de novo private sector

The private sector's technology is given by a CES function with an elasticity of substitution, $\varepsilon = \frac{1}{1+\rho}$, between two types of labor (β=1) or between the products generated by full time and moonlight workers allocating different efforts (β<1). Accordingly, with this function the de novo firm's maximization problem is;

$$\pi^p = p(\alpha(e^p N^{pp})^{-\beta\rho} + (1-\alpha)(e_0^p N^{pp})^{-\chi\rho})^{-\frac{1}{\rho}} - (w^{pp} + r\sigma^p)N^{pp} - w^{ps}N^{ps} \Rightarrow \max,$$

The term, $r\sigma^p$, gives any start-up costs associated with the provision of social benefits that might face de novo firms. We can imagine that such costs might be non-trivial particularly in a context where there is a poorly functioning real estate market.

The first order conditions for the maximization problem are;

$$pF'(\cdot)\alpha(e^p)^{-\beta\rho}(N^{pp})^{-\beta\rho-1} = w^{pp} + r\sigma^p$$

$$pF'(\cdot)\alpha(e_0^p)^{-\beta\rho}(N^{ps})^{-\beta\rho-1} = w^{ps}$$

With the CES function, we get the allocation of employment, as follows;

$$\mu = \frac{N^{ps}}{N^{pp}} = \left(\frac{e_0^p}{e^p}\right)^{\frac{\beta(\varepsilon-1)}{\beta+(1-\beta)\varepsilon}} \left(\frac{1-\alpha}{\alpha} \cdot \frac{w^p + p^p + b^p + r\sigma^p}{w^p}\right)^{\frac{\varepsilon}{\beta+(1-\beta)\varepsilon}}$$

Obviously, the number of workers of each type is determined by the ratio of compensation to effort (when $\varepsilon > 1$). The degree of such dependence is proportional to the elasticity of substitution. If the elasticity of substitution is equal to 1 there is no explicit dependence in the allocation of employment on the ratio of efforts (although there exists an implicit dependence on effort through the coefficients α and $1-\alpha$). The sensitivity in the allocation of labour to differences in wages, benefits, start-up costs and effort increases in step with the elasticity of substitution between the two types of labour. We should also notice that we have an implicit constraint on the number of full time workers which should be at least greater than, or equal to, one. A smaller value for the number of full time workers implies a corner solution. These are possible under two scenarios. The first arises if the effort exerted by full time workers is much greater than the effort exerted by part-time workers and the second if the start-up costs associated with providing social benefits are large.

Withdrawing subsidies: effects on compensation and employment

We have indicated that in a system where workers in state or privatised firms get compensated with a mix of cash wages and benefits and where outside provision of such benefits is restricted or where potential providers face large start-up costs, there will be a strong tendency for de novo firms to rely on part-time labour and hence for

informalization. This can obviously only occur because of the control structure of state firms which sanctions labour hoarding. We have made the assumption that state firms are prepared to continue financing benefits provision. Given the fact that firms have commonly been able to extract subsidies to maintain provision, this is not altogether surprising. We now look more closely at the likely decisions that a benefits-providing firm will take in the event of a contraction in subsidies and hence a change in the financing regime. We do this in two steps; the first does the comparative statics; the second goes a bit further in stylising the structure of the firm and the impact of the withdrawal of subsidy [9].

Case with exogenous benefits

The representative firm is assumed to maximize the utility of the insiders;

$U = N(w+b-x)$,

where w is monetary wage and b is benefits, x is the outside opportunity,

under a zero profit constraint,

$\pi_1 = pY(t)-(w+b(1-s))N = 0$

where s is the subsidy related to benefits provision.

In the first instance, we again assume Cobb-Douglas technology;

$Y = F(N) = (N)^{\beta}$, where $0 < \beta < 1$

From the zero profit constraint we find

$$c = w+b = \frac{pY}{N} + sb$$

and substituting into the utility function we get;

$$U = N(w+b-x) = N(\frac{pY}{N} + sb - x) = pY - N(x-sb)$$

Subsidies, sb, and hence benefits, b, are exogenously given.

The first order condition is

$$x - sb = pY' = \beta\frac{pY}{N}$$

Combining it with the constraint we get compensation;

[9] This section draws on and extends the analysis in Commander and Schankerman (1995).

$$c = w + b = \frac{pY}{N} + sb = \beta^{-1}x - (1-\beta)\beta^{-1}sb$$

and from

$$\frac{pY}{N} = \beta^{-1}x - \beta^{-1}sb$$

we get employment,

$$N = \left(\frac{\beta p}{x - sb}\right)^{\frac{1}{1-\beta}} > N_0 = \left(\frac{\beta p}{x}\right)^{\frac{1}{1-\beta}}$$ where N_0 is the case of no subsidies.

We can see that with subsidies, employment is clearly larger and compensation is smaller than in the case without subsidies. This is because they influence employment and compensation through the utility maximization and the constraint. Subsidies shift up the average product curve and allow for larger employment and/or compensation. But they also shift the relationship between inside and outside opportunities (*x* to *x-sb)* which will increase employment. Given the production function and the fact that $\beta < 1$, this channel acts more strongly on compensation resulting in lower compensation and larger employment than in the case without subsidies.

Let us see what will happen if subsidies are cut. Employment will decrease and compensation (and wages if social benefits are fixed) will increase in the short run. If we introduce a demand shock also (p(t) < p(0)) we will have the same increase in total compensation and a larger decrease in employment. Therefore, a demand shock influences employment only and leads to its further decline.

We should emphasize that all conclusions concerning the dependence of wages on subsidies are closely related to the assumption of Cobb-Douglas technology in the state sector with an elasticity of output with respect to employment of less than one. If we assume another form of production function, for instance, with linear average and marginal products;

$Y = N(\eta - aN)$

where η = maximum of average product and a = the slope of the average product curve, we get another solution of the maximization problem

$$N = \frac{p\eta - x + sb}{2pa}; \quad c = \frac{p\eta + x + sb}{2}; \quad w = c - b$$

In this case we have the same decline in employment when cutting subsidies, but we now also get a decline in compensation and wages when cutting subsidies. Therefore, we can see that the direction of change in wages when cutting subsidies depends on the choice of technology in the state sector. To see the conditions determining the sign of dependence of wages and compensation on subsidies, note that in general we find employment from the equation

$$x - sb = pY'$$

and diminishing returns ($Y'' < 0$) guarantees a positive dependence of employment on subsidies. To find compensation we use the equation;

$$c = w + b = \frac{pY}{N} + sb = \frac{x - sb(1 - E_N(Y))}{E_N(Y)}$$

If the elasticity of output with respect to employment is constant and less than one -- the case with Cobb-Douglas technology -- we have a negative dependence of compensation and wages on subsidies. If the elasticity of output with respect to employment is greater than one we find a positive relationship between compensation and subsidies. If the elasticity of output with respect to employment is not a constant the condition of negative dependence of compensation on subsidies takes the form

$$\frac{Y''}{(Y/N)'} \equiv \frac{MP'}{AP'} < 1$$

and it follows from the equation that,

$$\frac{\partial c}{\partial sb} = 1 + \frac{\partial AP}{\partial N}\frac{\partial N}{\partial sb} = 1 - \frac{\partial AP}{\partial N} : \frac{\partial MP}{\partial N}$$

It is easy to check that this second case of technology does not satisfy this condition and we have a positive dependence of compensation and wages on subsidies.

Case with endogenous benefits

In all the cases discussed above we could not say anything about how benefits change when cutting subsidies because we considered them as exogenous and looked at changes in total compensation only. In the case of wages, we assumed that benefits were

fixed. To separate out the consequences for both wages and benefits we must endogenize benefits. For this purpose we can also slightly change our set-up, supposing that wages and benefits are not perfect substitutes. Assuming for simplicity a separable utility function;

$$u(w,b,x) = \alpha_w \ln(w) + \alpha_b \ln(b) - \alpha_x \ln(x)$$

we can rewrite the utility of workers in the form

$$U = N(u(w) + u(b) - u(x))$$

In this case we can find the maximum of utility over the set of three variables (N, w, b) (if s<1). The first order conditions for the case s < 1 will be:

$$MRS_{wb} \equiv -\frac{dw}{db} = \frac{u'(b)}{u'(w)} = 1 - s(t)$$

$$u(w) + u(b) - u(x) = (1 - E_N(Y))u'(w)(w + (1-s)b)$$

which we must solve together with the zero profit constraint

$$pY - (w + b(1-s))N = 0$$

In the case of the simple utility function written above in logarithmic form and Cobb-Douglas technology (β < 1) we get from the first order conditions;

$$w = \frac{\alpha_w}{\alpha_b}(1 - s(t))b$$

$$N = \left(\frac{\alpha_b p}{(\alpha_b + \alpha_w)(1-s)b}\right)^{\frac{1}{1-\beta}}$$

$$b = e^{1-\beta} x^{\frac{\alpha_x}{\alpha_b + \alpha_w}} \left(\frac{\alpha_b}{\alpha_w (1-s)}\right)^{\frac{\alpha_w}{\alpha_b + \alpha_w}}$$

Substituting b into w and N,

$$w = \frac{\alpha_w}{\alpha_b}(1 - s(t))b = e^{1-\beta} x^{\frac{\alpha_x}{\alpha_b + \alpha_w}} \left(\frac{\alpha_w (1-s)}{\alpha_b}\right)^{\frac{\alpha_b}{\alpha_b + \alpha_w}}$$

$$N = \left(\frac{\alpha_b p}{(\alpha_b + \alpha_w)(1-s)b}\right)^{\frac{1}{1-\beta}} = \left(\frac{\alpha_w p}{(\alpha_b + \alpha_w) e^{1-\beta} x^{\frac{\alpha_x}{\alpha_b + \alpha_w}}}\right)^{\frac{1}{1-\beta}} \left(\frac{\alpha_b}{\alpha_w (1-s)}\right)^{\frac{\alpha_b}{\alpha_b + \alpha_w} \frac{1}{1-\beta}}$$

When cutting subsidies, we now get a decrease in benefits, an increase in wages and a decrease in employment. Therefore, the only qualitative difference with the previous set-up with risk-neutral individuals and exogenous benefits is that wages and benefits move in opposite directions when cutting subsidies on benefits. At the same time the elasticities of wages and employment with respect to subsidies will depend on the preferences of workers (α_b/α_w), as well as on the elasticity of output β.

If we reject the assumption of Cobb-Douglas technology in the state sector and again use a technology with linear average product we cannot find explicit expressions for wages, benefits and employment but we can find relationships for these quantities;

$$N = \frac{\eta}{a} - \frac{\alpha_w + \alpha_b}{\alpha_w a} w$$

$$(\alpha_w + \alpha_b)(1 + \ln w) - \frac{\alpha_w \eta}{w} = \alpha_x \ln x + \alpha_b \ln\left(\frac{\alpha_w (1-s)}{\alpha_b}\right)$$

$$\alpha_w + \alpha_b + \alpha_w \ln\left(\frac{\alpha_w (1-s) b}{\alpha_b}\right) - \frac{\alpha_b \eta}{(1-s)b} = \alpha_x \ln x - \alpha_b \ln b$$

It follows that employment and benefits are again positive functions of subsidies; wages again negatively depend on subsidies in contrast to the case of perfect substitutability between wages and benefits. We can also derive a general condition for the negative dependence of wages on benefits which takes the form;

$$\frac{MP}{AP} < 1 + \frac{MP'}{AP'}$$

it follows from the equation that,

$$\frac{\partial w}{\partial s}\left[1 + \frac{\partial MP}{\partial N} : \frac{\partial AP}{\partial N} - \frac{MP}{AP}\right] = -\frac{\alpha_w b}{\alpha_w + \alpha_b}$$

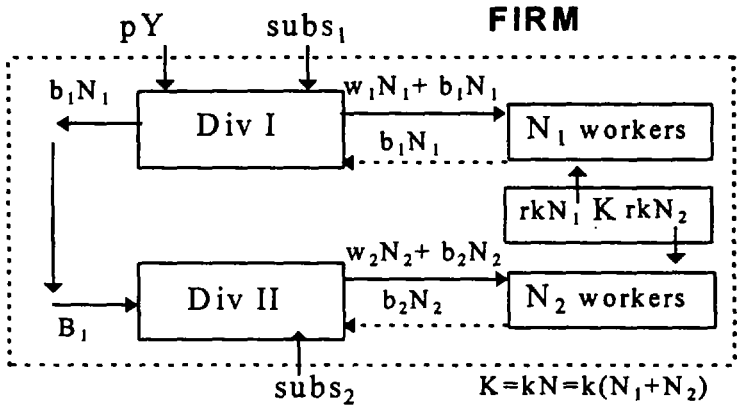
It can be easily seen that both examples of technology satisfy this condition.

Withdrawing subsidies and the structure of the firm

We now look at the implications of a subsidy withdrawal on the structure of the firm. We assume that, as before, the firm is insider dominated and that the firm will not be constrained by the labour demand curve but by the average product curve. We further stylise the firm as having two Divisions; Division 1 produces goods; Division 2 provides

benefits. Figure 1 provides a simple flow diagram putting together the respective costs and revenues of these two parts of the firm, where rkN_1 *and* rkN_2 are the opportunity costs of not renting or not selling the firm's social assets and included in the value of benefits, $b_i = b_i^0 + rk$.

Figure 1



As before, we let both divisions work under a zero profit constraint;

$\pi_1 = pY + subs_1 - w_1N_1 - b_1N_1 = 0$

$\pi_2 = b_1N_1 + b_2N_2 + subs_2 - w_2N_2 - b_2N_2 = 0$

which if only benefits are subsidised takes the form;

$\pi_1 = pY - w_1N_1 - (1-s)b_1N_1 = 0$

$\pi_2 = b_1N_1 + b_2N_2 - w_2N_2 - (1-s)b_2N_2 = 0$

From the last equation we can find the cost of providing benefits for Division 1,

$b_1N_1 = w_2N_2 - sb_2N_2$

which obviously decreases with increasing subsidies.

To get the allocation of employment between these two divisions, let us assume that the utility of only workers in Division 1 is maximized. We also assume that workers in Division 1 can make and enforce their decisions due to the fact that $N_1 > N_2$. In other words, majoritarian decisions are binding.

We accordingly write;

$U_1 = N_1(u(w_1) + u(b_1) - u(x)) \rightarrow \max$

Again we think of the firm continuing to operate under a zero profit constraint

$$\pi_1 = pY - w_1 N_1 - (1-s)bN_1 = 0$$

$$\pi_2 = bN_1 + sbN_2 - w_2 N_2 = 0$$

Assuming for simplicity that benefits per worker are the same in both sectors, that is; $b_1 = b_2 = b$ and assuming Cobb-Douglas technology for Division 1 we have;

$Y = F(N_1) = (N_1)^{\beta}$, where $0 < \beta < 1$

We can now find benefits, wages and employment in Division 1 in the same way as we did above. Substituting them into the expression for employment in Division 2, which we get from the second profit constraint, we obtain;

$$N_2 = \frac{\alpha_b p}{(\alpha_b + \alpha_w)(1-s)} \cdot \frac{N_1^{\beta}(s)}{w_2 - sb(s)}$$

or

$$N_2 = \frac{\alpha_b p}{(\alpha_b + \alpha_w)(1-s)} \cdot \frac{\left(\frac{\alpha_w p}{(\alpha_b + \alpha_w) e^{1-\beta} x^{\frac{\alpha_x}{\alpha_b + \alpha_w}}}\right)^{\frac{\beta}{1-\beta}} \left(\frac{\alpha_b}{\alpha_w (1-s)}\right)^{\frac{\alpha_b}{\alpha_b + \alpha_w} \frac{\beta}{1-\beta}}}{w_2 - s e^{1-\beta} (\alpha_b + \alpha_w) x^{\frac{\alpha_x}{\alpha_b + \alpha_w}} \left(\frac{\alpha_b}{\alpha_w (1-s)}\right)^{\frac{\alpha_w}{\alpha_b + \alpha_w}}}$$

As employment in Division 1 and benefits per worker are positively related to subsidies, we get a decrease in employment in Division 2 when cutting subsidies to social benefits, assuming the wage in Division 2 to be fixed. The implication is that faced with a withdrawal of subsidy, a two-part firm dominated by workers in one of the two Divisions -- in this case, the producers -- will tend to scale back employment in the benefits-providing part of the firm. Given what we know from our earlier exercise, the result will tend to be loss of benefits provision in the hard budget constrained firm.

Conclusion

A feature of the transition in much of the FSU has been the relatively small amount of unemployment that has been generated. In contrast to East and Central Europe, employment in state and privatised firms has stayed high. Although there has been some labour shedding, hoarding has remained significant. At the same time, the de novo private

sector's growth though far from trivial has been quite distinct from Eastern Europe. In the latter, de novo firms appeared early in the transition, initially in services, and then expanded into other sectors. While there has ben significant tax evasion by de novo firms, they have mostly been distinct economic entitities. By contrast, in the FSU de novo firms have tended to be closely linked to existing state or privatised firms and to have been widely dependent on part-time, informal labour.

These differences can be attributed to a variety of factors, not least the continuation of soft budget constraints. But there are several specific features that have exacerbated this outcome. Primary among these has been the legacy of social protection in the firm and the associated structure of compensation. Workers have continued to receive a significant share of compensation in non-monetary form and this share has tended to increase through the transition. Instead of laying off workers, firms have cut hours and wages but have proven remarkably averse to outright separations. This probably reflects the structure of internal control and the coalitions that have been formed among insiders. It can also be traced to pressures from government -- local and federal -- on firms to limit the flow of workers into unemployment.

Given this structure of control by insiders, we have concentrated on the resulting incentives for workers to maintain attachment to state or privatised firms and for the associated informalisation of de novo private employment. With benefits and benefits financing associated to state and privatised firms, we found that there would be a strong incentive for workers to stay in those firms but allocate their effort in part-time or moonlighting activity in the de novo private sector. This result is, of course, emphasized when benefits provision is a source of subsidy.

We then go on to look at the implications of a loss of subsidy for the compensation and employment decisions of insider dominated firms. We show that, under certain conditions, such firms will tend to scale down benefits provision and employment. Extending this further to the case of a firm with two divisions; one that produces, one that provides benefits, we see that workers in the dominant division -- the producing one -- will tend to close down the benefits providing division if a simple majoritarian decision rule is assumed. This raises some important issues relating to the

maintenance of an optimal supply of benefits that we do not deal with here. Rather, our focus has been on trying to explain the factors behind the low, open unemployment, high informalisation that is so very clearly a feature of the FSU economies.

References

Alfandari, Gilles and Mark Schaffer (1995), 'On Arrears in Russia', in Simon Commander, Qimiao Fan and Mark Schaffer (eds), 'Enterprise Restructuring in Russia', Economic Development Institute, Development Series, Washington DC, forthcoming

Boycko, Maxim, et al (1995), 'Privatising Russia', MIT Press, Cambridge

Cohen, Daniel, (1995), 'Success and Failure in Russian Reforms', Paris, mimeo

Commander, Simon, Sumana Dhar and Ruslan Yemtsov (1995), 'How Russian firms make their wage and employment decisions', in Commander, Fan and Schaffer

Commander, Simon, Une Lee and Andrei Tolstopiatenko, (1995), 'Social Benefits and the Russian Industrial Firm', in Commander, Fan and Schaffer

Commander, Simon and Mark Schankerman, (1995), 'Enterprise Restructuring and the Efficient Provision of Social Benefits', World Bank and EBRD, mimeo

Estrin, Saul, John Earle and Larisa Leshchenko, (1995), 'Privatisation and Corporate Governance in Russia', in Commander, Fan and Schaffer

European Bank for Reconstruction and Development, (1995), 'Transition Report', London

Le Houerou, Philippe, (1995), 'Fiscal Management in the Russian Federation', World Bank, Washington DC

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